

A conspectus of *Acacia* subg. *Acacia* in Australia

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Summary

Pedley, L. (2002). A conspectus of *Acacia* subg. *Acacia* in Australia. *Austrobaileya* 6 (2): 177–186. *Acacia* subg. *Acacia* is represented in Australia by 11 species. A key to species, notes on the geographical ranges and habitats of each and references to published descriptions are given. *A. clarksoniana* and *A. douglasica* are described as new. The lectotypification of *A. pallida* F. Muell. and the application of the name *A. pallidifolia* Tindale are discussed at some length and, as an adjunct, *A. valida* Tindale & Kodala is treated as a synonym of *A. pallidifolia* and *A. turbata* is described for *A. pallidifolia* auct. non Tindale (*A. pallida* var. *major* Benth.).

Key words: *Acacia* subg. *Acacia*, *Acacia pallidifolia*, *Acacia clarksoniana*, *Acacia douglasica*, *Acacia turbata*.

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Introduction

Acacia subg. *Acacia* is represented in Australia by eleven species, two of them naturalised. Except for *A. bidwillii* which extends into subtropical Queensland, the endemic species are confined to the seasonally dry tropics. The species have been adequately collected only in the last 50 years and considerable confusion still exists in their taxonomy and nomenclature. The Australian species are part of the autochthonous Australian flora. The adjacent Malesian region has only two endemic species of *Acacia* subg. *Acacia*, both of which extend to the Asian mainland and neither of which occurs in Australia (Nielsen 1992).

Much evidence has accumulated (Pedley 1986, Brain 1990, Chappill & Maslin 1995) indicating that *Acacia* subg. *Acacia* is generically distinct from the other recognised subgenera: *Acacia* subg. *Phyllodineae* (DC.) Seringe (genus *Racosperma* Martius) and *Acacia* subg. *Aculeiferum* Vassal (genus *Senegalia* Raf.).

Species of the subgenus are, on the whole, distinctive but, as in many other groups of *Acacia*, identification from herbarium specimens may present difficulties. These difficulties are usually caused by inadequate material or specimens taken from depauperate, young or particularly vigorous plants. The key to species makes use mainly of attributes of the indumentum of branchlets and of dimensions and number of parts of leaves, with occasional use of floral characters. Pods of *A. farnesiana* and *A. nilotica* are particularly distinctive but, except for these two, attributes of pods and seeds are not used in the key.

The serious pest status of *A. nilotica* subsp. *indica* in northern Australia and its being the target of biological control measures (Mackey 1998) have prompted this review. Basic information on related taxa is essential for the successful implementation of control programs.

Key to species of *Acacia*

1. Flowers in spikes; axis of leaves 12–14 cm long; (10–)15–17 pairs of pinnae per leaf; leaflets 3–5 mm long, c. 0.7–1.2 mm wide **1. *A. sutherlandii***
- Flowers in heads; axis of leaves up to 25(–30) cm long; (1–)2–55 pairs of pinnae per leaf; leaflets 1.5–15 mm long, 0.5–2 mm wide 2

2. Leaves often borne on short shoots; petiole to 1 cm long; 1 or 2 pairs of pinnae per leaf, their axes 1–2.5 cm long; leaflets 1.5–5 mm long, 0.5–1.2 mm wide; heads of fewer than 10 flowers; seeds woolly, glabrescent **2. A. suberosa**
 Leaves not on short shoots; petiole often more than 1 cm long; pinnae usually more than 2 pairs per leaf; heads of more than 15 flowers; seeds glabrous 3
3. Pinnae 22–55 per leaf; leaflets 0.8–1.5 mm long, 0.4–0.7 mm wide **3. A. ditricha**
 Pinnae often fewer, but if 22–55 per leaf then leaflets 1.5–5 mm long, 0.7–1.2 mm wide 4
4. Pinnae (1–)2–4 pairs per leaf; leaflets 4–7.5(–9) mm long, 1–2 mm wide; branchlets reddish with conspicuous lenticels; involucler at top of peduncle, hidden by open flowers; pod round in cross-section, 1 cm or more diam. **4. A. farnesiana**
 Pinnae rarely fewer than 4 pairs; branchlets pubescent or, if glabrous, then not with conspicuous lenticels, or leaflets wider; pods flat 5
5. Axes of pinnae 4–15(–20) cm long; leaflets large, 4–20 mm long, 1.5–6 mm wide 6
 Axes of pinnae 1.5–4 cm long; leaflets smaller, (1–)1.5–6 mm long, 0.5–1.5 mm wide 7
6. Leaflets 1–12 pairs per pinna, each 4–20 mm long, 1.5–6 mm wide; gland minute, inconspicuous, between lowest pair of pinnae; corolla 3–4.5 mm long; branches pendulous **5. A. pachyphloia**
 Leaflets 13–34 pairs per pinna, each 5–14 mm long, 1.5–4 mm wide; usually a prominent scutellate gland between or immediately below lowest pair of pinnae of some leaves; corolla to 3.5 mm long; branches not pendulous **6. A. turbata**
7. Ultimate branchlets reddish, glabrous or with long spreading hairs; thin, discoid or elongated gland between or immediately below lowest pair of pinnae 8
 Ultimate branchlets not particularly reddish, pubescent with short erect hairs sometimes overtopped by long spreading ones; gland, in some species, large and conspicuous 9
8. Leaflets 16–20(–25) pairs per pinna; flowers large, corolla 3.4–3.8 mm long **7. A. bidwillii**
 Leaflets 20–35 pairs per pinna; flowers smaller, corolla 3–3.2 mm long ... **8. A. douglasica**
9. Branchlets with indumentum of uniformly short hairs; axis of leaves 3–6 cm long; up to 10 pairs of pinnae per leaf; petiolar gland absent or inconspicuous; pods densely tomentose, flat, strongly constricted between the seeds forming ± orbicular segments **9. A. nilotica** subsp. **indica**
 Branchlets with indumentum of long and short hairs; axis of leaves (3.5–)6–25(–30) cm long; (6–)10–45 pairs of pinnae per leaf; pods ± flat, parallel-sided 10
10. Axis of leaves 6.5–25(–30) cm long; (6–)10–45 pairs of pinnae per leaf; leaflets (1.5–) 1.8–5(–6) mm long, (0.5–)0.7–1.2 mm wide; large conspicuous gland between or immediately below lowest pair of pinnae, (1.3–)1.8–4.5 mm long, 1.4–2.2 mm wide, usually a second gland between most distal pair of pinnae **10. A. pallidifolia**
 Axis of leaves 6–8 cm long; 12–16 pairs of pinnae per leaf; leaflets 1.8–2.5 mm long, 0.5–0.7 mm wide; a single gland between or immediately below lowest pair of pinnae, smaller, 1–1.5 mm long, 0.3–0.5 mm wide **11. A. clarksoniana**

- 1. *Acacia sutherlandii*** (F. Muell.) F. Muell.; Icon. Australian Sp. Acacia. dec. 12 (1888); Pedley, *Austrobaileya* 2: 307 (1980); Kodela & Tindale, Fl. Australia 11A: 196 (2001). *Albizzia sutherlandii* F. Muell., Fragm. 6: 22 (1867). **Type:** Flinders River, *J. Sutherland* 114 (holo: MEL).

A graceful tree with pendulous branchlets which occurs on heavy soils usually in groves in Mitchell-grass (*Astrebla* spp.) grassland from the Barkly Tableland, Northern Territory to the Aramac-Muttaburra area of Queensland. Everist (1986) stated that it is eaten fairly readily by sheep and cattle, though it contains high levels of cyanogenetic glycosides (Conn & Maslin 1982).

- 2. *Acacia suberosa*** A. Cunn. ex Benth., Hook. London J. Bot 1: 499 (1842), Fl. Austral. 2: 420 (1864); Wheeler, Fl. Kimberley Reg. 327 t. 97D (1992); Kodela & Tindale, Fl. Australia 11A: 203 (2001). **Type:** Careening Bay, 3rd Voyage of *Mermaid*, Sept. 1820, A. *Cunningham* 300 (lecto, *fide* Kodela, Fl. Australia 11A: 642 (2001): K).

Confined to the Kimberley region of Western Australia and the north of the Northern Territory in a variety of habitats (see Wheeler, *loc. cit.*) but often reported from cracking clay soils. The species is probably without any close relatives as it has an unusual combination of attributes, including woolly seeds.

- 3. *Acacia ditricha*** Pedley, *Austrobaileya* 1: 307 (1980); Wheeler, Fl. Kimberley Reg.: 301 t. 98B (1992); Kodela, Fl. Australia 11A: 203 (2001). **Type:** Kowanyama Aboriginal Reserve, Mitchell River, Dec. 1977, B. *Alpher* (holo: BRI).

Tree to 6 m tall with grey-brown corky bark; branchlets densely tomentose with spreading hairs c. 0.5 mm long and shorter (0.2 mm) ones, indumentum extending to base of stipules, petioles and rachises of leaves; pale lenticels evident on older branchlets; stipules spinose, 1–4 mm long on ultimate branchlets, brown. Leaves: axis 5.5–13.5 cm long, including petiole 4–7 mm long, a dark discoid

or ellipsoidal gland 0.5–2 mm long, 0.5–1 mm wide, immediately below lowest pair of pinnae, rarely a second smaller gland between the next pair of pinnae; pinnae 22–50 pairs per leaf, rachis 13–20 mm long, each with 24–30 pairs of leaflets each 0.8–1.5 mm long, 0.4–0.7 mm wide, thick, only the midrib visible beneath, a few short spreading hairs near margins. Heads of 20–25 flowers on single axillary peduncles c. 4 cm long with a small involucre about the middle. Flowers 5-merous; calyx c. 1 mm long, shortly lobed, pubescent in the upper part; corolla 2.5–3 mm long; stamens 5–6 mm long, anther with a minute stipitate gland at the apex; ovary pubescent. Pods flat, oblong, 5–10 cm long, 1–1.8 cm wide, valves thinly coriaceous, tomentose, occasionally glabrescent, slightly constricted between seeds. Seeds arranged longitudinally, discoid to obloid, 8–12 × 8–10 mm, funicle folded once over seed but not arillate, pleurogram closed or slightly open, areole large, slightly paler than the rest of the seed and depressed.

Much more common and widespread than suggested in the protologue. It has a disjunct distribution: Cape York Peninsula, Queensland, the eastern part of the north of the Northern Territory, and the Kimberley region of Western Australia. It is distinguished from other Australian species by its small leaflets, and large number of pinnae per leaf.

Tindale & Kodela (1996), when describing *A. valida* (= *A. pallidifolia*), compared it with *A. ditricha* but they seemed to have taken a wide view of the latter, including in it *A. douglasica*. In view of this confusion with *A. douglasica*, a description of *A. ditricha*, based on considerably more specimens than were available when the species was first described, is provided.

- 4. *Acacia farnesiana*** (L.) Willd., Sp. Pl., ed. 4: 1083 (1806); Benth., Fl. Austral. 2: 419 (1864); Ross, *Bothalia* 11: 471 (1975); Pedley, *Austrobaileya* 2: 308 (1980); Maslin in Jessop (ed.); Fl. Central Australia: 142 (1981); McVaugh, Fl. Nova Galiciana 5: 127 (1987). Clarke *et al.*, Syst. Bot. 14: 559 (1989); Morrison & Davies in Harden, Fl. New South Wales 2: 392 (1981); Tame, *Acacias Southeast Australia*: 29 t. 1 (photograph

& line drawing) (1992); Nielsen, Fl. Malesiana 11(1): 44 (1992); Symon (ed. 2 of Whibley), Acacias Sth Austral.: 292 t. 155 (1992); Wheeler, Fl. Kimberley Reg.: 302 t. 98B (1992); Kodela & Tindale, Fl. Australia 11A: 205 (2001). *Vachellia farnesiana* (L.) Wight & Arn., Prod. Fl. Penin. Ind. Orient.: 272 (1834). *Farnesia odora* Gasp., Desc. Nuov. Gen. (1836). *Popanax farnesiana* (L.) Raf., Sylva Tellur. 118 (1838). *Mimosa farnesiana* L., Sp. Pl.: 521 (1753). **Type:** Plate in Aldinus, Descr. Rar. Pl. Rom. Farnesiano 4 (1625) (lecto, *fide* Ross 1975).

Acacia pedunculata Willd. ed. 4. Sp. Pl. 4: 1084 (1806). **Type:** 'Habitat in Java', T. Horsfield (holo: B-W, microfiche seen).

Acacia lenticellata F. Muell., J. Proc. Linn. Soc. Bot. 3: 147 (1859). **Type:** Albert River [Qld], 30 Aug. 1856, F. Mueller (lecto, *fide* Ross, Fl. Australia 11A: 642 (2001): MEL, n. v.)

Native to probably the northern part of the American tropics, introduced into Australia possibly before European settlement, now naturalised in all mainland states except Victoria. It occurs in a variety of habitats but is most common on clay soils, often alluvial in origin. It is regarded as a useful fodder in semi-arid regions but sheds its leaves in dry periods.

Clarke *et al.* examined material of *A. farnesiana* from southern United States, Mexico and the Caribbean and discussed variation within the species. They formally recognised one variant as *A. farnesiana* var. *guanacastensis*, though they also suggested that further study of South American and Caribbean material was desirable. All specimens that I have seen from the Old World are referable to *A. farnesiana* var. *farnesiana*. Willdenow stated that *A. pedunculata* differed from *A. farnesiana* in having long peduncles, but after examining microfiche of the type, I agree with Clarke *et al.* that the two are conspecific.

5. *Acacia pachyphloia* W.V.Fitzg. in Maiden, J. & Proc. Roy. Soc. New South Wales

51: 116 (1917); Wheeler, Fl. Kimberley Reg.: 317 (1992); Dunlop *et al.*, Fl. Darwin Reg. 2: 17 t. 7 (1995); Tindale & Kodela, Austral. Syst. Bot. 9: 311 (1996); Kodela, Fl. Australia 11A: 198 (2001). **Type:** Western Australia: hills near Camp 92 in proximity to the Synot Range, July 1905, W.V. Fitzgerald 1267 (lecto, *fide* Tindale & Kodela: NSW, n.v.; iso: PERTH, n.v.).

Tindale & Kodela (1996) distinguished two subspecies, *A. pachyphloia* subsp. *brevipinnula* from the Kimberley region of Western Australia and *A. pachyphloia* subsp. *pachyphloia* from the Kimberley region and the northern part of the Northern Territory. The species usually occurs in eucalypt woodland communities on variety of soils. Differences between it and *A. turbata* its most closely related species are noted under *A. pallidifolia*.

6. *Acacia turbata* Pedley **sp. nov.** affinis *A. pachyphloia* W.Fitzg. subsp. *pachyphloia* a qua foliis saepe glandula petiolarum grandi scutellata ornatis, foliolis plerumque parvioribus, 6–14 mm longis, 1–4 mm latis, discoloris, marginibus recurvatis, 15–25 paribus in quoque pinna, ramulis non cernuis differt. **Typus:** Northern Territory. E of Mary River, ± 13°05'S 131°55'E, 29 Sept. 1946, S.T.Blake 17095 (holo: BRI, two sheets).

Acacia pallida auct. non F.Muell. nec Willd; Benth., Fl. Austral. 2:421 (1864).

Acacia pallidifolia auct. non Tindale; Tindale, Telopea 1: 82 (1975); Dunlop *et al.*, Fl. Darwin Reg. 2: 17 (1995); Kodela, Fl. Australia 11A: 199 (2001).

Acacia turbata is most closely related to *A. pachyphloia* but differs in having a large scutellate petiolar gland on some leaves, usually smaller discoloured leaflets with recurved margins, fewer pinnae and more leaflets. The branches are not pendulous. It occurs in the Fitzmaurice River area and sporadically across the extreme north of the Northern Territory usually in eucalypt and mixed woodland on the edges and floors of shallow valleys.

Though Tindale proposed *A. pallidifolia* as a *nomen novum* for *A. pallida* F.Muell, the name should be applied to the species that was described later as *A. valida* Tindale & Kodela. The complex situation is discussed under *A. pallidifolia*. The specific epithet is Latin, meaning 'disturbed' or 'disordered', an allusion to the tangled nomenclature of it and *A. pallidifolia*.

7. ***Acacia bidwillii*** Benth., *Linnaea* 26: 629 (1855), Fl. Austral. 2: 420 (1864); Pedley, *Austrobaileya* 2: 310 (1980); Kodela, Fl. Australia 11A: 204 (2001). **Type:** Wide Bay, *Bidwill* (holo: K).

Acacia leptoclada var. (?) *polyphylla* Benth., Fl. Austral. 2: 416 (1864). **Type:** East Coast, *R. Brown* '4331' (holo:K).

Acacia bidwillii var. *polytricha* Domin, *Biblioth. Bot.* 89: 273 (1926). **Type:** in xeridrymio apud opp. Mungana, Feb. 1910, *K. Domin* '5148' (holo: PR, herb. no. 527948).

The species ranges, in coastal and subcoastal districts of Queensland, from about the latitude of Cooktown to the vicinity of Gayndah, with a marked disjunction to the Mt Isa–Cloncurry region, usually as a scattered understory tree in eucalypt communities. Since it is extremely variable in habit, size of petiolar gland and leaflets, spacing of pinnae along the rachis, and density of indumentum, further study is needed to clarify its taxonomy. Some plants from coastal areas between Townsville and Gladstone approach *A. ditricha* in having leaves with many pinnae and small leaflets, but they lack the indumentum characteristic of that species.

Though treated here as a synonym, the status of *A. bidwillii* var. *polytricha* is still uncertain. Specimens from the Chillagoe–Mungana area (its type locality) and from near Einasleigh, some 200 km to the south, are particularly hairy, but, since most specimens of the species have at least scattered hairs, this may be of little taxonomic significance. The holotype of *A. leptoclada* var. *polyphylla* appears to represent a juvenile plant. It has well developed stipular spines 6 mm long and smaller leaflets than are usual in herbarium

specimens of the species. *A. bidwillii* var. *major* Benth. is considered to be the same as *A. pallidifolia*.

8. ***Acacia douglasica*** Pedley, *sp. nov.* affinis *A. bidwillii* Benth. et *A. clarksoniana* Pedley; ab illa foliolis pluribus in quoque pinna et floribus parvioribus, et ab hac ramulis tantum pilis dispersis longis obtectis et glandule parviore discoidea inter pinnae paria infima differt. **Typus:** Northern Territory, 0.5 km W of Douglas River, 13°47' 131°23', 23 Oct. 1974, *M. Parker* 508 (holo: BRI; iso: DNA, & (n.v.) CANB, NSW).

Acacia 'Douglas R.', Dunlop *et al.*, *Flora of Darwin Region* 2: 20 t. 4 (1995).

Acacia ditricha auct. non Pedley; Tindale & Kodela, *Austral. Syst. Bot.* 9: 311 (1996), *pro parte*.

Tree to 5 m tall; bark corky, grey-brown; branchlets reddish, angular with scattered straight hairs 0.3 mm long, reddish glandular trichomes on growing tips; stipules on flowering stems, sparse, straight, c. 0.75 mm long. Leaves: axis 40–75 mm long (including petiole 5–8 mm), scattered to moderately dense hairs on broadly sulcate surface, disc-like gland between lowest pair of pinnae; pinnae in 11–22 opposite or subopposite pairs, axis 15–30 mm long, a few hairs; pinnae with 20–35 pairs of oblong leaflets, each 1.6–2.2 mm long, 0.5–0.7 mm wide, thick, veins obscure, glabrous or with a few marginal hairs. Heads of 15–30 flowers on peduncles usually single in upper axils; peduncles c. 40 mm long with scattered long hairs; involucre in upper half; receptacle with stiff hyaline hairs; bracteoles narrowly spatulate, c. 1.5 mm long, subglabrous. Flowers 5-merous; calyx c. 1.6 mm long, lobes 0.3 mm long with a few long hairs on tips; corolla c. 3.2 mm long, lobes c. 0.7 mm long with long hairs and minute bladder-like trichomes on margins; stamens c. 7 mm long, some anthers with stipitate globular appendages; ovary pubescent. Pods c. 6.5 cm long and 1.5 cm wide, described as 'creamy-coloured', somewhat pubescent but becoming black and glabrous with age; seeds longitudinal, obloid, c. 10 mm long and c. 9 mm wide; pleurogram prominent, open; areole large, depressed. Fig 1C,D.

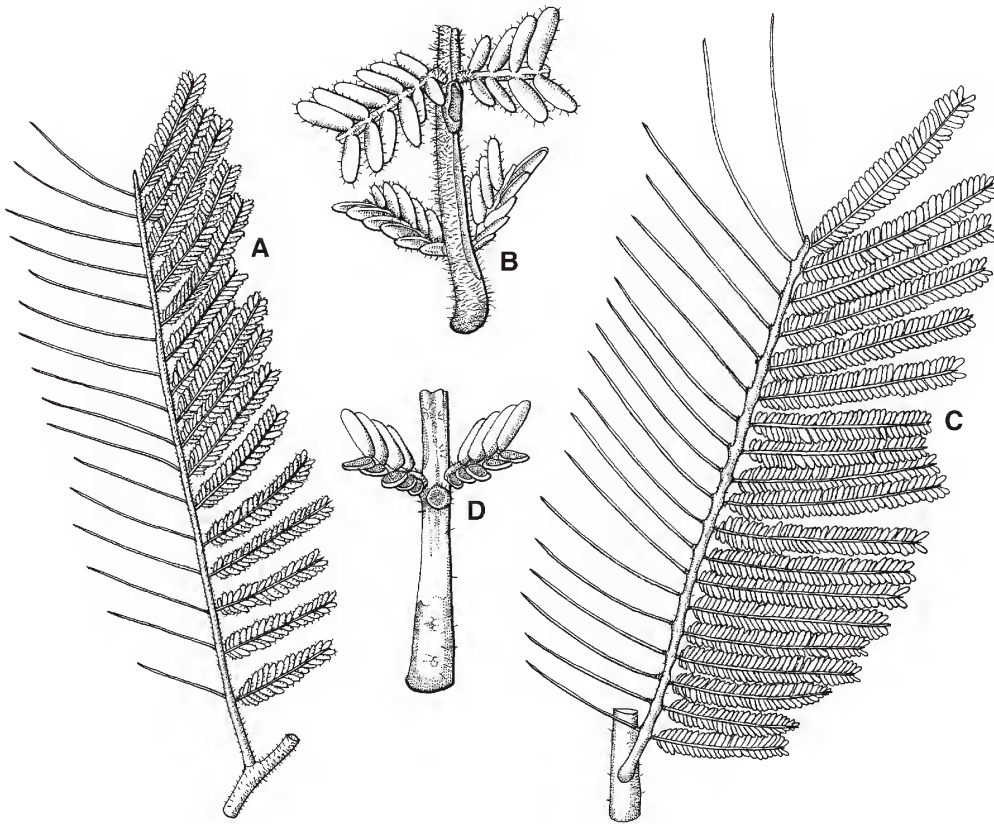


Fig. 1. A & B: *Acacia clarksoniana*. A. leaf $\times 1$; B. petiole with indumentum and nectary $\times 3$. C & D: *A. douglasica*. C. leaf $\times 1$; D. petiole with indumentum and nectary $\times 3$. A & B: Clarkson 3585 (BRI). C: Rankin 1232 (BRI). D: Tindale 6098 (BRI).

Distribution and habitat: Known only from the Douglas–Daly Rivers area where it occurs on cracking clay soils (*vide* Dunlop *et al.*).

Affinities: Its closest relative is *A. bidwillii* with *A. clarksoniana* more distant. It has more leaflets per pinna and the leaflets are smaller than those of *A. bidwillii*. It lacks the rather dense indumentum of *A. clarksoniana* and has smaller flowers. Tindale & Kodela compared *A. valida* (= *A. pallidifolia*) to *A. ditricha* but from a specimen seen (Tindale 6098, BRI), it seems that they included *A. douglasica* in their circumscription of *A. ditricha*.

Etymology: The specific epithet consists of the name of the river, Douglas, with the Latin adjectival suffix *-ica*.

9. ***Acacia nilotica*** (L.) Willd. ex Del., Fl. Aegypt. Ill.:79 (1813); A.F. Hill, Bot. Mus. Leaflet. Harvard Univ. 8: 97 (1940); Brenan, Fl. Trop. East Africa: Legum. Mimosoid.: 89 (1959); Ross, Mem. Bot. Surv. Sth Africa 44: 106 (1979). **Type:** Egypt, *Herb. Linn* 1228.28 (lecto, *vide* Ross: LINN, n.v.).

One subspecies occurs in Australia.

- Acacia nilotica* subsp. *indica*** (Benth.) Brenan, Kew Bull: 84 (1957); Ross, Mem. Bot. Surv. Sth Africa 44: 107 t. 85e (pod); Pedley, *Austrobaileya* 2: 309 (1980); Kostermans, Rev. Handb. Fl. Ceylon 1: 488 (1980); Symon (ed. 2 of Whibley), *Acacias Sth Austral.*: 29 t.

116 (1992); Kodela, Fl. Australia 11A: 204 (2001). **Syntypes:** "East India", *Roxburgh* (K); Oungein, *sine coll.*, *Herb. Benth.* (K).

Native of southern Asia, introduced into Queensland probably as a shade tree particularly in holding yards around abattoirs, and as a fodder. Trees persist around homesteads and watering-points but in recent years the plant has become a serious weed in grassland on heavy soils in central-western Queensland. It extends to the Barkly Tableland of the Northern Territory and occurs also at 'Cordillo Downs' in the extreme north-east of South Australia.

10. *Acacia pallidifolia* Tindale, *Teloepa* 1: 82 (1975).

A. pallida F. Muell, J. & Proc. Linn. Soc., Bot. 3: 147 (1859), *nom. illeg. non* Humb. & Bonpland ex Willd. (1806). *Acacia bidwillii* var. (?) *major* Benth., Fl. Austral. 2: 421 (1864). **Type:** Victoria River, *Mueller* 76 (holo: K; iso: MEL, *vide* Tindale & Kodela, n.v.).

Acacia sp. H Wheeler, Fl. Kimberley Reg.: 336 t. 98E (1992).

Acacia valida Tindale & Kodela, Austral. Syst. Bot. 9: 307 (1996); Kodela & Tindale, Fl. Australia 11A: 201 (2001). **Type:** Northern Territory: Mathison Creek, c. 91.5 km W of Katherine on the Victoria Highway, 2 Aug. 1979, *M.D. Tindale* 10101 *et al.* (holo: NSW, n.v.; iso: BRI, K, others n.v.), *syn. nov.*

Confined to the north of the Northern Territory and the Kimberley region of Western Australia. Tindale & Kodela (1996) have given a detailed description (as *A. valida*) and notes on distribution and habitat of the species.

The correct application of the name *A. pallidifolia* presents some difficulties. Bentham's role in the publication of descriptions of species of *Acacia* by Mueller (1859b) is important in deciding the application of the name *A. pallida* F. Muell. and, consequently, of *A. pallidifolia*. The paper is a quirky one, difficult to deal with under

the International Code of Botanical Nomenclature. As a foreword to it, Bentham wrote (*pro parte*): "In so far as the specimens have admitted it, I have, at Dr Mueller's request, carefully compared his species with those nearly allied to them, and added any remarks which suggested themselves at the end of his descriptions. In the few cases where I clearly identified them with others previously described, I have given the published names adding his manuscript ones for the purpose of reference, and retaining his characters as completing our previous knowledge of the plants." Bentham had an unmatched knowledge of Australian acacias; as well as earlier collections of Mueller, he had access to those of Banks and Solander, Brown, and Cunningham. It is not surprising therefore that he was more critical than was Allan Black who edited Mueller's companion paper on eucalypts (Mueller 1859a). Black altered the names of only two of the 38 species of eucalypt treated, both on sound nomenclatural grounds, whereas names of 12 of the 115 species of *Acacia* were changed. Bentham considered 11 of the species described as new by Mueller to be the same as already described species, and two identified as *A. delibrata* var. ? and *A. julifera* to be undescribed species which he named *A. oligoneura* and *A. torulosa* respectively. Bentham suggested that another nine names might be synonymous with published names, but he allowed Mueller's names to stand. Because they were treated as synonyms by Bentham, Mueller's names have been regarded as invalid. All, except *A. calligera*, *A. reclinata* and *A. pterocarpa* (the last a later homonym) have since been validated.

Mueller cited specimens for the great majority of species. Some of the specimens are assigned numbers, which were treated as Mueller's herbarium numbers by Bentham (either, for example, as *Hb. M.* No. 71 for *A. stipulosa* or, more commonly merely as No. 5, No. 40, etc.). The numbers run from 1 to 100, but some 30 are missing, not assigned to taxa; the biggest gap is from 43 to 79. The same number is sometimes used for up to three different species. All of Mueller's numbers were not cited in the text, as the specimens numbered 71 and 90 are mentioned only in Bentham's discussion under *A. oligoneura* and

no. 75 in his discussion under *A. pallida*. The sequence of the numbers does not appear to be correlated with the geographic distribution or the taxonomic relationship of the species. No specimens were sent for six of the species (*vide* Bentham), one of which (*A. plagiophylla*) had been given a herbarium number, while pods of two species were described by Mueller though fruiting specimens had not been sent.

Bentham clearly did more than communicate Mueller's paper and provide notes on new species, as was stated after the title. Bentham's remarks are, however, placed in parentheses, are clearly separated from Mueller's text, and may best be considered as being published as 'Bentham in Mueller', as was done by Tindale & Kodala when they described *A. valida*. There might be a suspicion that some of Mueller's numbers were omitted from the text, but the published material is all that should be considered in typification.

Bentham's notes are therefore not part of the protologue of *A. pallida* F.Muell. and cannot have any bearing on the application of the name. The only specimen cited in the protologue is *Mueller 76* which was from the Victoria River and had pods (*vide* Bentham's notes). The specimen is in the Herbarium at Kew. According to Article 9.1 of the current International Code of Botanical Nomenclature this must be the holotype of the name *A. pallida* as it is the only specimen designated (though evidently not the only one used) by the author in drawing up his description. Lectotypification, as set out in Article 9.9, is not possible as there are no syntypes and the specimen designated (no. 76) does not belong to more than one taxon. It is irrelevant that Bentham considered 'a flowering specimen of Dr Mueller's marked 75 from McAdam's Range... answered better to his character [of the leaves] and the stipular spines of the *Gummiferae*', and that there is a flowering specimen marked '76, 75' at MEL which is evidently a duplicate of *Mueller 76* at K. Tindale's lectotypification was therefore unnecessary and is rejected. The name *A. pallidifolia* must therefore be applied to the species later described as *A. valida* while the taxon represented by the specimen *Mueller 75* (and presumably of *Mueller 75,76*, Tindale's

'lectotype' of *A. pallida*) is still without a legitimate name at the rank of species. It is treated here as *A. turbata*.

Blake (1953) pointed out that Mueller sometimes retained only fragments of his specimens and sometimes sent everything to Kew. Mueller (1857) wrote 'Let me however, Sir William [Hooker], state that you receive always the whole of the specimens of every rare kind, nothing of many species having been retained at all, or that I satisfied myself with a solitary leaf and flower, or fruit, in many cases.' The specimen *Mueller 76* can then be reasonably treated as the holotype of *A. pallida* F.Muell. Perhaps Mueller retained what he considered a representative piece of the species which he labelled '76,75', or perhaps a piece was returned from Kew so labelled.

Among the species described by Mueller (1859), *A. pallida* is unusual in that it is one of only two for which Bentham mentioned in his notes a specimen not cited by Mueller. It might be argued that Bentham was co-author of the name *A. pallida*. If this argument were accepted then lectotypification of the name would be necessary. Tindale's treatment would result in *A. pallidifolia* being the correct name for *A. turbata* as recognised here and *A. valida* for the species treated here as *A. pallidifolia*. Such an argument however is untenable. Bentham, in separating his comments from Mueller's text, made it clear that he considered Mueller to be the author of the paper. It would be contrary to the spirit of Bentham's commentary to regard him as co-author.

11. *Acacia clarksoniana* Pedley, sp. nov.
affinis *A. pallidifolia* Tindale a qua foliis glande petiolari parviore, rhachide plerumque breviore, glande inter pinnae apicales nulla, pinnis saepe paucioribus, foliolis paucioribus angustioribusque praeditis differt. **Typus:** Queensland. COOK DISTRICT: 3.9 km from 'New Dixie' homestead, 15°05'S 143°20'E, 15 Oct. 1980, *J.R. Clarkson* 3585 (holo: BRI; iso, K & (n.v.) ILL, MEL, MO, NSW, PERTH, PR, QRS).

Tree facultatively deciduous, to 5 m tall with pale brown tessellated bark; branchlets terete, hirsute with erect hyaline hairs c. 0.1 mm long

and scattered longer ones to 0.7 mm long, red-glandular trichomes conspicuous on developing leaves; stipules on flowering branches straight, rather innocuous, 1.5–2 mm long. Leaves: axis 6–8 cm long (including petiole c.1 cm long), hairs similar to those of branchlets, a sessile gland 1–1.5 mm long, 0.3–0.5 mm wide, c. 0.3 mm thick immediately below lowest pair of pinnae; pinnae 12–16 pairs per leaf, somewhat alternate, each 1.5–2 cm long; leaflets oblong, in 15–26 pairs on each pinna, 1.8–2.5 mm long, 0.5–0.7 mm wide, long hairs on margins, midrib prominent on lower surface. Peduncles 1.5–4 cm long with indumentum similar to that of branchlets, involucrel at about the middle; heads of c. 30 flowers, receptacle with long hairs and red-glandular trichomes, bracteoles linear c.1mm long. Flowers 5-merous; calyx 1.2–1.6 mm long, lobes 0.2–0.3 mm long with long hyaline hairs on margins; corolla 2.7–3 mm long, lobes 0.3–0.5 mm long with long hyaline hairs; stamens 4–5 mm long, anthers with a globular appendage c. 0.1 mm diam., ovary glabrous. Pods not seen. Fig. 1 A, B.

Distribution and habitat: Restricted to the south-central part of Cape York Peninsula where it occurs in low hilly country in rather open vegetation. Its geographic range abuts that of *A. ditricha* which occurs in country of lower relief.

Affinities: The species affinities are with *A. pallidifolia* which has a large petiolar gland, a second smaller gland between the most distal pair of pinnae, usually longer pinnae with more, usually, larger leaflets.

Etymology: The species is named in honour of Mr John R. Clarkson who has made many valuable plant collections in tropical Queensland.

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Appendix

Collections examined. *Acacia bidwillii* (bid), *A. clarksoniana* (cla), *A. ditricha* (dit), *A. douglasica* (dou), *A. farnesiana* (far), *A. nilotica* subsp. *indica* (nil) *A. pachyphloia* subsp. *brevipinnula* (pac/bre), *A. pachyphloia* subsp. *pachyphloia* (pac/pac), *A. pallidifolia* (pal), *A. suberosa* (sub), *A. sutherlandii* (sut) and *A. turbata* (tur). The collection number given is that of the principal collector. In some cases (for example, Perry & Lazarides and Everist & Smith) the collectors are considered to be jointly responsible for the collection. Specimens marked with an asterisk (*) are types of the names of the species.

Adams, L.G. 1026, 1206 far. Anderson, E.R. 143, 762A & B bid; 843 nil; 882 bid; 2183, 3678 sut. Andrews, S.B. 37 bid. Basedow, H. 49 nil. Batianoff, G.N. 232 far; 900403T, LL9104018, LN9104051, 911040, 9207267, 9303114, 9403158, 9403325, 9805211 bid; 980544 far. Bean, A.R. 826 nil; 3374, 5201, 4158, 9347 bid; 10478 far; 11208 bid; 14109 far. Beaumont, T.E. 7153 far. Blake S.T. 6268 far; 12602, 13697 dit; 16443 pac/pac; 17095*, 17166 tur; 17221 pal; 17977 far; 18886 bid. Bolton M.P. 138, 793 far. Boughton, V. 11, 296, 302 far. Boyland, D.E. 164, 8081 far. Brass, L.J. 279 sut; 2530, 33510 bid. Brennan, B.P.M. 15078 bid. Burbidge, N.T. 5520 sut. Bushell, J.J. 1039 sut. Bynes, N.B. 628 pal; 2228 sub; 3052, 3057 far; 3107 sut; 3659 bid. **Carolin**, R.C. 6326 far. Cassels, M.L. 14890 bid. Chippendale, G. NT3641 far; NT3718 pal; NT3848 sut. Clark, M.J. 509 dit; 1282 tur. Clarkson, J.R. 1052, 2715 bid, 3367, 3419, 3429 dit; 3584, 3585* cla; 3677 far; 5058 bid; 5461, 6021 far; 9515, 9593 dit; 9600 bid. Cole, M.M. 3000 pal; 5102 far; 6000, 9109, 9127 sut. Cole, M.M. & Provan, D. 20 tur; 362 dit. Correll, R.L. 34 far. Court, O.M. 55 far. Coveny, R. 6522, 6572 far; 6913 bid(?); 6884, NSW107796, NSW107913, NSW107916 far. Cowie, I.D. 352 tur; 7821 pal. Craven, L.A. 3160 nil. Curtis, H.S. 327 far. **Dalliston**, C. HC311 far; HC326 sut. De Lestang, A. 401 sut. Dockrill, A.W. 403 far. Dunlop, C.R. 4023 pal. Durrington, L. 134 far. **Ebersohn**, J. E227 far. Evans, M. 3273, 3443 pal. Everist, S.L. 206 bid; 3028, 3842 sut; 4389, 6338, 7305 far. **Fell**, D.G. DF2214 dit. Fensham, R. 2665 nil. Filson, R. 3362 far. Forbes, S. 2566 far. Forster, P.I. PIF1055 bid; PIF2049, PIF2158 far; PIF8502 bid; PIF13060 dit; PIF15859, PIF18305, PIF18531 bid; PIF18769, PIF20638, PIF22197 far. **Gasteen**, W.G. 376 dit. Gibson, N. 944 bid. Gittins, C.H. 584 bid; 1092, NSW101479 far. Godwin M. C912, C1044, GJM1544 bid. Grimshaw, P. PG 2217 bid. **Hacker**, J.B. BH586, JT1091 far. Hall, N. 79/35, H84 sut. Halliday, T.A. 360 bid. Henderson, R.J. H1366 bid; H2157 sut. Henry, N.M. 256 sut. Hill, R. & Lothian, T.R.N. 978 far. Hind, P.D. 11 far; 1069, 2473, NSW108066 sut. Hubbard, C.E. 7306 sut. **Innis**, G. 20 sut. Irvine, A.K. 84, 737 bid. **Jackes**, E.M. 20 bid. Jacobs, S.W. 1135 bid; 1422, NSW107574 sut; NSW107580 bid; 1732 dit. Jobson, P.C. 1784 bid. Johnson, R.W. 2169 nil. **Kanis**, A. 1906 far. Kenneally, K.F. 5288 pac/pac; 6770, 8553 pac/bre; 8560 pal; 10682 pac/pac. Knuckey, G. 14 far. **Latz**, P.K. 75 pac/pac. Lazarides, M. 3104 sub; 3967 sut; 4874, 5159, 6515 sub; 6709 pal; 6793 pac/pac; 6959 bid; 7744 sub; 8670 pal. Lazarides, M. & Adams, L.G. 99 tur. Leach, G.J. 3265 pac/pac; 3296 pal; 3405 pac/pac. **McDonald**, K.R. 334 bid; CC47 sut. McDonald, M. 327 pac/pac. McDonald, T.J. 542 far; 1648 bid. McGillivray, W. 3820 pac/pac. McKee, H.S.

9360 bid. Maconochie, J.R. 237, 1175 sub; 1214 dit; 1436 tur; 2655 sut; 2660 cla. Maloney, B. 21 far. Martensz P. 95 far. Maslin B.R. 2085 far. Michael, N. 603 bid. Monkhorst, K.A. 1001 dit. Moriarty, V.K. 215 bid. Morrow, J.C. 27 far. **Neldner**, V.J. 623 far; 2000 bid; 3465 far; 3472 bid; 4085 dit. Niall, J. 128 bid. Nicholson, K. 5450 sut. **Ollerenshaw**, P. PO1074 far; PO1292 sut. Olsen, T. 8/92 dit. O'Keefe, B. 7 sut. **Parker**, M. 508* dou. Parsons, D.J. 89 bid. Pedley, L. 1849 dit; 1943 sut; 2110, 4587 bid; 4846 dit; 4009, 4869, 5015 bid; 5032 far; 5311, 5314, 5319 sut; 5368 nil; 5484 bid. Perry, R.A. 954, 994, 1370, 1454 sut; 2056 pal; 2237, 2680 far. Perry R.A. & Lazarides, M. 2056 pal; 2237 far; 2647 dit; 2680 far; 2833 dit. Podberscek, M. 19 bid. Purdie, R.W. 2276 far. **Rankin**, M.O. 1232 dou; 1282 pac/pac; 1358, 1663 pal. Rodd, A.N. 4473 sut; 4474 bid. Ross, J.H. 3779 tur. **Sands**, M. 5124 far. Scarth-Johnson, V. 68 far; 1140A bid. Searle, SDS645, SDS785 bid. Shelley, J.R. 19 far. Simmons, J.G. 1526, 3376 bid. Slec, A. 2400 far; 2948 pac/pac; 3523 nil. Smith, E.J. 12 far. Smith, L.S. 3526 bid; 4294, 4602 far. Smyrell, G. GS82 sut. Speck, N.H. 1647 pal; 2008 far. Stanley, T.D. 633, 80276 far. Stanton, J.P. 296 bid, JPS2659 dit. Staples, I.B. IBS2124, IBS2219 bid. Stokes, S.J. 16 pal. Story, R. 45 far. Swarbrick, J.T. 9857 bid. Swinbourne, R. 701 dit. **Taylor**, P. 81 far. Thomson, B. 253 nil. Thompson, E.J. 432 bid. Tindale, M.D. 6098 dou; 10101 pal; 10124 far. Tothill, J.C. N1344 far. Trainor, C. 40 far. Trapnell, W.G. 69 pal; 74, E83, 159 bid; 163 sut. **Wannan**, B.S. 1035 far. Warran, C.M. CMW600 far. Waterhouse, B.M. BMW1903 far; BMW5049 bid; BMW5036, BMW5189 far. Waterhouse, J.T. 11013 far. Webb, L.J. 3301 far; 5546, 8154 bid; 11077 far; 11078 sut; 11125 far. Weber, J.Z. 9358 far. White, C.T. 1362 bid; 7020 far; 10575 sut; 12616 far. Widt, M. RHF45 far. Williams, K.A. 185 sut. Wilson, P.L. pac/pac. **Young**, P. 421 bid.